

REMARKS

Claims 1-9 are pending in the subject application. By the instant amendment, claim 1 is amended to more particularly recite the subject matter of the present invention. Claim 5 is amended to maintain consistency with claim 1 as amended. Claim 6 is amended to clarify the scope of the present invention. Further, new claims 10-19 are added. No new matter has been added, as support for the instant amendment may be found in specification and drawing figures as originally filed, for example, in paragraphs [0028] and [0040] and FIG. 1. Claims 1, 6 and 15 are independent.

Filed concurrently herewith is applicants' claim for foreign priority and a certified copy of the priority document.

Applicants appreciate the Examiner's consideration of the Information Disclosure Statements filed March 5, 2004.

Applicants further appreciate the Examiner's indication that claims 7-9 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants additionally appreciate the Examiner's acceptance of the drawings figures filed on August 5, 2003.

Claims 1-19 are presented to the Examiner for further or initial prosecution on the merits.

A. Introduction

In the outstanding Office action, the Examiner rejected claims 1-6 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,813,584 to Zhou et al. ("the Zhou et al. reference") and objected to claims 7-9 as being dependent upon a rejected base claim, but

indicated that claims 7-9 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. It is noted that page 2 of the outstanding Office action indicates that claims 1-10 are rejected under 35 U.S.C. § 102(e), however, based on a totality of the Office action, it is clear that it is claims 1-6 that are rejected under 35 U.S.C. § 102(e), and not claims 1-10.

B. Asserted Anticipation Rejection of Claims 1-6

In the outstanding Office action, the Examiner rejected claims 1-6 under 35 U.S.C. § 102(e) as being anticipated by the Zhou et al. reference. Independent apparatus claim 1 has been amended to more particularly recite the present invention, and it is respectfully submitted that claim 1 is now allowable for at least the reasons set forth below. The rejection of independent method claim 6 is respectfully traversed for at least the reasons set forth below.

Independent Apparatus Claim 1

Claim 1 has been amended to more particularly recite the structure of the microprocessor of the present invention, as described, for example, in connection with FIG. 1. As discussed throughout the original specification, the microprocessor performs an attitude error compensation based on the two-axis earth magnetic sensor. This function is performed in part by a virtual Z-axis earth magnetic data generation part 104, as described in paragraph [0028] of the original specification.

Resultantly, the present invention is able to use a two-axis magnetic sensor in the calculation of an azimuth angle because the present invention is able to generate virtual Z-axis earth magnetic data using only the two-axis magnetic sensor and an inclinometer.

While FIG. 3 of the Zhou et al. reference may disclose a microprocessor, the microprocessor of the Zhou et al. reference fails to disclose or suggest “the microprocessor including a virtual Z-axis earth magnetic data generation part for generating virtual Z-axis earth magnetic data based on the outputs of the two-axis magnetic sensor and the inclinometer,” as presently recited in independent claim 1. The Zhou et al. reference fails to disclose this feature because the Zhou et al. reference discloses use of three-axis magnetometers, e.g., col. 6, line 48. Accordingly, the Zhou et al. reference is able to measure actual data in three-axis and would have no need to generate virtual data for a third axis based on actual data from two axes.

Further, paragraph [0046] of the subject application teaches:

According to the apparatus for calculating the azimuth angle by the attitude error compensation of the earth magnetic sensor according to the present invention, the azimuth information provided to the user overcomes the technical limit of the earth magnetic sensor module, which should use the existing three-axis earth magnetic sensor and the inclinometer, using the two-axis earth magnetic sensor and the two-axis inclinometer.

As may be seen from the above statement, a feature of the present invention is to overcome the need for a three-axis magnetic sensor and an inclinometer to calculate an azimuth angle by using a two-axis magnetometer and an inclinometer, and then generating virtual Z-axis earth magnetic data to perform attitude error compensation.

As the Zhou et al. reference clearly relies on a three-axis magnetometer, and fails to disclose or even suggest use of only a two-axis magnetic sensor, as in the present invention, it is respectfully submitted that the Zhou et al. reference fails to disclose or suggest the present invention as set forth in claim 1. In view of the above distinction between the subject

invention as presently claimed and the cited prior art reference, it is respectfully submitted that claim 1 is allowable over the Zhou et al. reference.

Claims 2-5, which depend from claim 1, are believed to be similarly allowable for at least the reasons set forth above regarding claim 1. Accordingly, reconsideration and withdrawal of the rejections of claims 1-5 are respectfully requested.

Independent Claim 6

It is respectfully submitted that the Zhou et al. reference fails to disclose or suggest each and every limitation of independent method claim 6. Specifically, the Zhou et al. reference fails to disclose or suggest “generating a virtual Z-axis earth magnetic data using a two-axis earth magnetic sensor,” as originally recited in independent claim 6.

As described above in connection with independent apparatus claim 1, the Zhou et al. reference relies on a three-axis magnetometer to perform the measurements therein. The Zhou et al. reference fails to disclose or suggest use of only a two-axis magnetometer and then generation of virtual data for a third axis based on the measurements regarding the other two axes and an inclinometer, as disclosed in the subject application and recited in the present claims.

In the outstanding Office action, the Examiner indicates that the Zhou et al. reference “further discloses generating the Z-axis earth magnetic data using the sensors in figure 1.” *Office action of Dec. 14, 2005, at p. 4.* However, this is not what is recited in claim 6. Claim 6 recites “generating a *virtual* Z-axis earth magnetic data using a two-axis earth magnetic sensor.” The Zhou et al. reference discloses using three-axis magnetometers to generate actual X-axis, Y-axis, and Z-axis earth magnetic data. There is no virtual data generated because the data is actually measured by the three-axis magnetometers.

In view of the above distinction between the subject invention as presently claimed and the cited prior art reference, claim 6 is believed to be in condition for allowance, and a notice to such effect is respectfully requested.

Accordingly, reconsideration and withdrawal of the rejection of claim 6 are respectfully requested.

C. New Claims 10-19

By the instant amendment, new claims 10-19 are added. No new matter is added by the instant amendment.

New claims 10 and 11 depend from independent claim 6, which is believed to be in condition for allowance, and are believed to be similarly allowable as claims depending from an allowable base claim. New claims 12-14 depend from independent claim 1, which is believed to be in condition for allowance, and are believed to be similarly allowable as claims depending from an allowable base claim. New claim 15 is independent and is believed to be allowable for at least the reasons set forth above in connection with the previously discussed claims. New claims 16-19 depend from independent claim 15, which is believed to be in condition for allowance, and are believed to be similarly allowable as claims depending from an allowable base claim.

Accordingly, it is respectfully submitted that new claims 10-19 are in condition for allowance, and a notice to that effect is respectfully requested.

D. Allowable Subject Matter

The indication that claims 7-9 contain allowable subject matter is gratefully acknowledged. However, in view of the above amendments and remarks, it is respectfully submitted that all of the claims of the present invention are in condition for allowance.

E. Conclusion

Since the cited prior art reference neither anticipates nor renders obvious the subject invention as presently claimed, applicants respectfully submit that claims 1-19 are now in condition for allowance, and a notice to that effect is respectfully requested.

The remaining documents cited by the Examiner were not relied on to reject the claims. Therefore, no comments concerning these documents are considered necessary at this time.

If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing amendments and remarks, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all the claims is hereby requested.

Respectfully submitted,

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PETITION and
DEPOSIT ACCOUNT CHARGE AUTHORIZATION

This document and any concurrently filed papers are believed to be timely. Should any extension of the term be required, applicant hereby petitions the Director for such extension and requests that any applicable petition fee be charged to Deposit Account No. 50-1645.

If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

Any additional fee(s) necessary to effect the proper and timely filing of the accompanying-papers may also be charged to Deposit Account No. 50-1645.